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I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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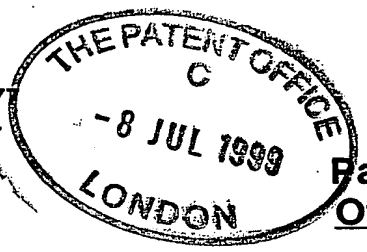
Signed [redacted]

Dated 20 March 2002

Patents Form 1/77
Patents Act 1977
(Rule 16)



The Patent Office

09JUL99 E460854-7 D02917
P01/7700 0.00 - 9916086.3

Request for grant of a patent

The Patent Office
Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference
1830401/AM

2. Patent Application Number **9916086.3** 08 JUL 1999

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Scientific Generics Limited
Harston Mill
Harston
Cambridgeshire CB2 5NH

Patents ADP number *(if known)* 8746003

If the applicant is a corporate body, give the country/state of its incorporation — Country: **ENGLAND** State:

4. Title of the invention

WAVELENGTH DIVISION MULTIPLEXING FOR FREE SPACE OPTICAL COMMUNICATIONS

5. Name of agent — **Beresford & Co**

"Address for Service" in the United Kingdom to which all correspondence should be sent

2/5 WarwickCourt
High Holborn
London WC1R 5DJ

Patents ADP number 1826001

6. Priority details

Country	Priority application number	Date of filing

Patents Form 1/77

7. If this application is divided or otherwise derived from an earlier UK application give details

Number of earlier of application | Date of filing

8. Is a statement of inventorship and or right to grant of a patent required in support of this request?

YES

9. Enter the number of sheets for any of the following items you are filing with this form.

Continuation sheets of this form	
Description	**2**
Claim(s)	
Abstract	
Drawing(s)	**3** + 3

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents form 7/77)*	**1 + 2 COPIES**
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for Substantive Examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application

Signature Beresford & Co Date 8 July 1999

BERESFORD & Co

12. Name and daytime telephone number of person to contact in the United Kingdom

ALAN MACDOUGALL

Tel:0171-831-2290

Patents Form 7/77
Patents Act 1977
(Rule 15)

The Patent Office

Statement of inventorship and of right to grant of a patent

The Patent Office
Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference
1830401/AM

08 JUL 1999

2. Patent Application Number
accompanying application reference 1830401

9916086.3

3. Full name of the or each applicant

Scientific Generics Limited

4. Title of the invention

WAVELENGTH DIVISION MULTIPLEXING FOR FREE SPACE OPTICAL COMMUNICATIONS

5. State how the applicant(s) derived the right from the inventor(s) to be granted a patent

BY VIRTUE OF EMPLOYMENT.

6. How many, if any additional Patents Forms 7/77 are attached to this form?

NONE

11. I/We believe that the person(s) named over the page (and on any extra copies of this form) is/are the inventor(s) of the invention which the above patent application relates to.

Signature Beresford & Co
BERESFORD & Co

Date 8 July 1999

12. Name and daytime telephone number of person to contact in the United Kingdom

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Patents Form 7/77

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Wavelength Division Multiplexing for Free Space Optical Communications

Background

The applicant has described in WO98/35328 an optical communication system employing a pixellated reflective modulator array combined with a telecentric optical system. The system operates by assigning each user of the system a unique pixel in the array. Each pixel in the array maps to a unique angular position in the field of view of the telecentric optical system (figure 1). The content of WO98/35328 is incorporated herein by way of reference.
Whilst a number of optical modulator technologies may be employed to produce systems according to WO98/35328, Quantum Confined Stark Effect (QCSE, sometimes also referred to as Self Electro-Optic Effect Devices or SEEDs) have advantages that they can operate at high bandwidths (in excess of 1GHz) and can be formed in large arrays.

Wavelength Division Multiplexing (WDM) is a technique well known in optical fibre communication systems. A number of lasers at different wavelength are combined via a Wavelength Division Multiplexer into a single optical fibre. The signals are transmitted over a single fibre, and each wavelength is then separated with a Wavelength Division Demultiplexer onto a separate receiver. Since each laser can be individually modulated to carry data, the total data bandwidth of such a system is thus n times the rate for each individual laser, where n is the number of lasers used.

Our invention concerns the use of WDM in a free space optical system of the type described in WO98/35328.

Description of the Invention

In systems according to our invention, we combine a number of `receivers' into a single optical channel. Each receiver consists of a laser, beam splitting optics and optical receiver as described in WO98/35328. However, in this case each receiver has a laser at a different wavelength, and dichroic optics are used to combine the receivers output beams into a single beam, as shown in figure 2. The combined beam would typically be expanded using a telescope prior to transmission.

The QCSE modulator is a wavelength sensitive device. Figure 3 shows typical response curves for such a modulator as a function of wavelength.

The particular wavelength response can, however, be selected at time of manufacture. Therefore, in systems according to our invention, dichroic optics are used to separate

the various transmitted wavelengths to wavelength matched QCSE arrays, as shown in figure 4.

Systems according to our invention have the advantage that the bandwidth available to each user of the system is increased by a factor equal to the number of laser wavelengths available.

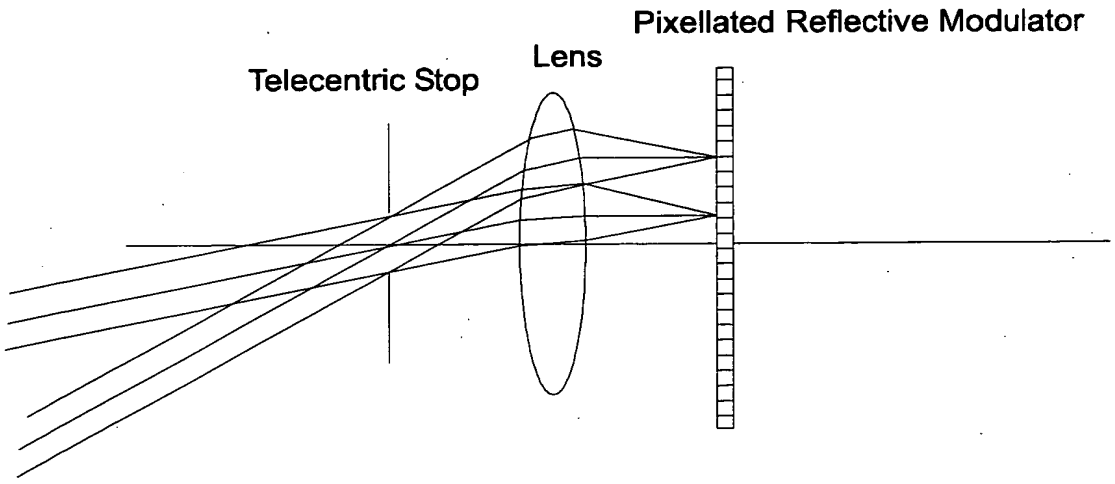

Figure 1

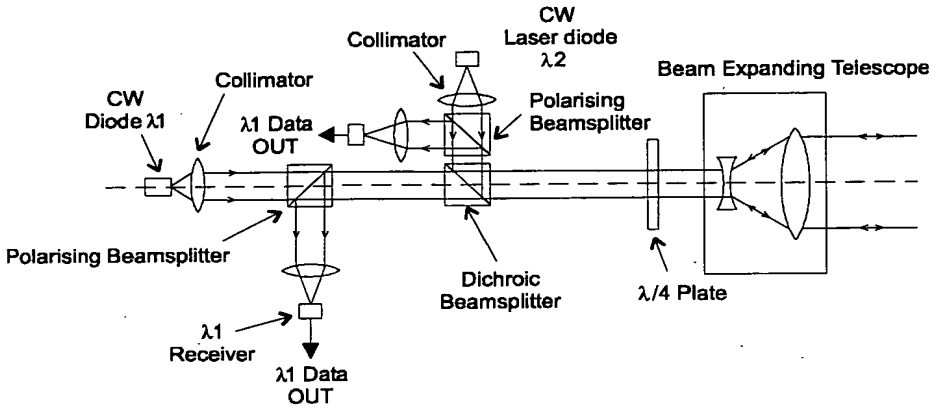

Figure 2

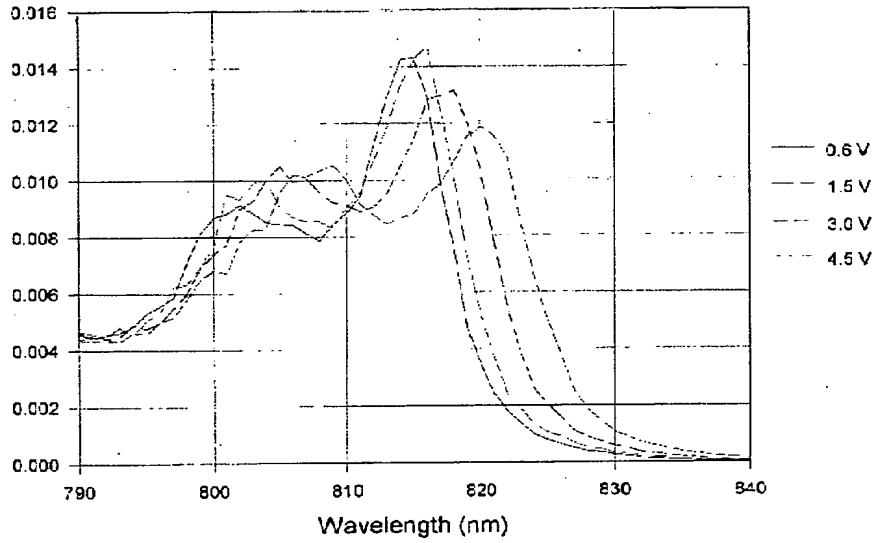

Figure 3

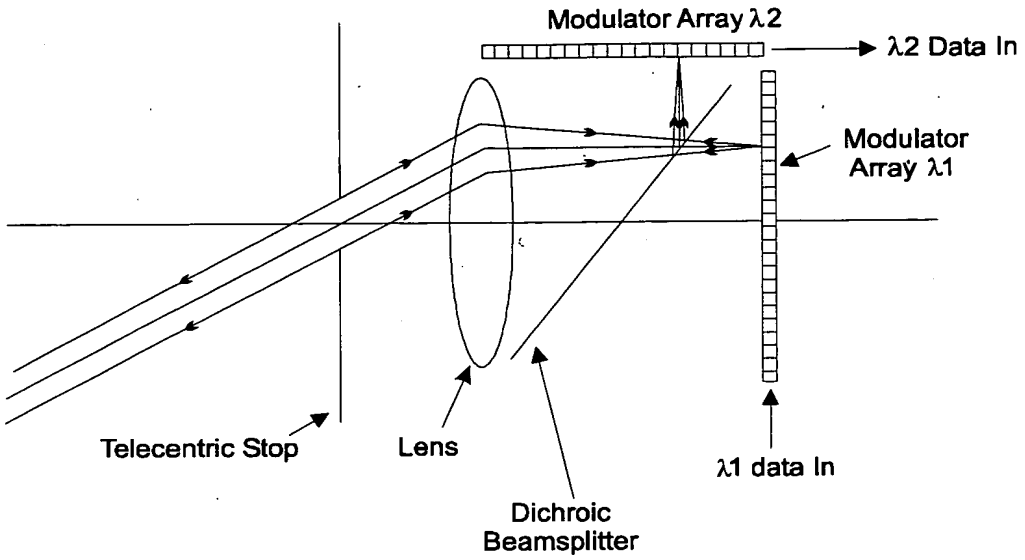
Modulator Array λ2
λ2 Data In
Modulator
Array λ1
Telecentric Stop
Lens
λ1 data In
Dichroic
Beamsplitter

Figure 4

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SERIAL NO: 10/038,576

DOCKET NO: 08364.0034